

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
5 August 2004 (05.08.2004)

PCT

(10) International Publication Number  
**WO 2004/064660 A3**

(51) International Patent Classification<sup>7</sup>: **A61C 3/00**

(21) International Application Number:  
PCT/IL2004/000069

(22) International Filing Date: 23 January 2004 (23.01.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/350,288 23 January 2003 (23.01.2003) US

(71) Applicant (for all designated States except US):  
**TACTILE TECHNOLOGIES LLC** [US/US]; 3993  
HOWARD HUGHES PARKWAY, SUITE 540, LAS-VE-  
GAS, NV 89101 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WEINSTEIN,**

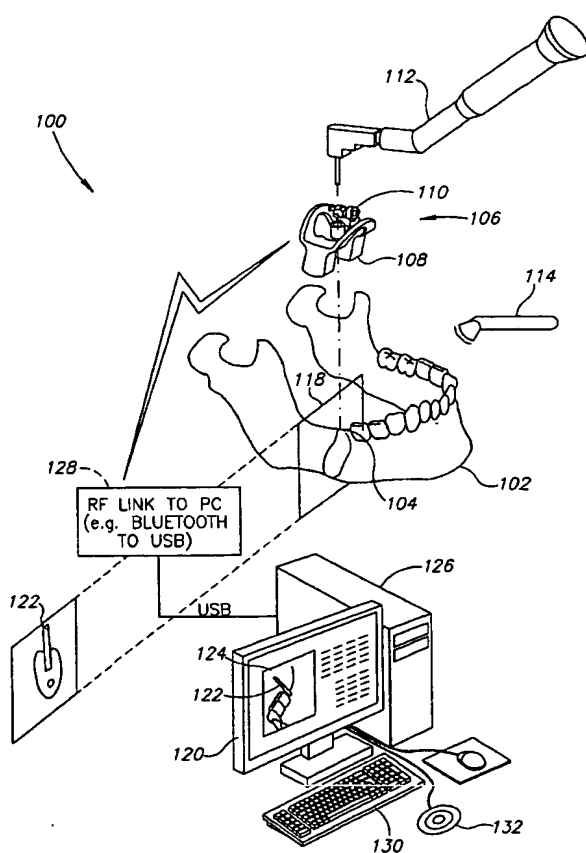
Uriel [IL/IL]; 31 TARMAG STREET, 76804 MAZK-  
ERET-BATYA (IL). YOHAI, Yuval [IL/IL]; 17 SMI-  
LANSKY STREET, 76446 REHOVOT (IL). KINROT,  
Opher [IL/IL]; 22 HERZL STREET, 43354 RAANANA  
(IL).

(74) Agents: **FENSTER, Paul et al.**; FENSTER & COM-  
PANY, INTELLECTUAL PROPERTY 2002 LTD., P.O.  
BOX 10256, 49002 PETACH-TIKVA (IL).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

[Continued on next page]

(54) Title: DENTAL TOOL GUIDES



(57) Abstract: A method of dental registration, comprising, rigidly coupling a base element to a maxillofacial area; inserting an object comprising at least one of a tool and a tool guide into a mouth in said maxillofacial area; and determining a position of said object relative to said rigid element without a reference element outside of said mouth.

WO 2004/064660 A3



(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:

25 August 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL04/00069

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61C 3/00

US CL : 433/75

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 433/72, 75, 76; 33/513, 514

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Us 6,402,707 B1 (ERNST) 11 June 2002 (11.06.2002), see entire document.	1-3
---		
Y		4-62, 64-66, 90, 92, 93, 106
Y	US 5,842,858 A (TRUPPE) 01 December 1998 (01.12.1998), column 2, line 40, through column 3, lines 36, and column 14, lines 9-22.	4-62
Y	US 5,176,516 A (KOIZUMI) 05 January 1993 (05.01.1993), column 3, lines 16-36.	7, 29, 85
X	US 5,967,777 A (KLEIN et al) 19 October 1999 (19.10.1999), see entire document.	63, 67-84, 86, 87
---		
Y		24, 62, 64-66, 85
Y	US 5,562,448 A (MUSHABAC) 08 October 1996 (08.10.1996), see entire document.	30-45, 118-120
Y	US 5,800,168 A (CASCIONE et al) 01 September 1998 (01.09.1998), column 9, lines 6-34.	46-50
Y	US 5,954,647 A (BOVA et al) 21 September 1999 (21.09.1999), column 9, lines 50-59.	51-54



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

14 April 2005 (14.04.2005)

Date of mailing of the international search report

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

John J. Wilson

Telephone No. 703-308-0861

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL04/00069

## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,597,304 A (RAY et al) 28 January 1997 (28.01.1997), column 4, lines 44-49.	55-59, 113
Y	US 4,878,842 A (MALCMACHER et al) 07 November 1989 (07.11.1989), column 3, lines 20-37.	60
X	US 6,488,638 B2 (MUSHABAC) 03 December 2002 (03.12.2002), see entire document.	88, 89, 91, 94-105, 107-112
Y		90, 92, 93, 106, 113
X	US 3,063,149 A (SUGA) 13 November 1962 (13.11.1962), see entire document.	114-117, 121, 125- 130, 132, 135-143
Y		118-120, 122-124, 131, 133, 134
Y	US 4,998,881 A (LAUKS) 12 March 1991 (12.03.1991), column 6, lines 28-40.	122, 123
Y	US 3,078,580 A (GALVEZ) 26 February 1963 (26.02.1963), column 2, lines 55-69.	124
Y	US 5,015,183 A (FENICK) 14 May 1991 (14.05.1991), column 5, lines 13-22.	133, 134

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL04/00069

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐  
☒

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL04/00069

### BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

- I. Claims 1-87 drawn to a method of dental registration and a base used in the method.
- II. Claims 88-113 drawn to a dental tool guide having an electronic encoder.
- III. Claims 114-124 drawn to a dental tool guide aiming device.
- IV. Claims 125-143 drawn to a dental tool guide having a lock.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The method and base of Group I do not require the use of a tool guide having an encoder configured to electronically report an orientation as claimed in Group II.

The inventions listed as Groups I and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The method and base of Group I do not require the use of an tool guide aiming device including an base, guide holder or control as claimed in Group III.

The inventions listed as Groups I and IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The method and base of Group I do not require the use of a tool guide having a lock which selectively mechanically locks the guide section.

The inventions listed as Groups II and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The tool guide of Group II does not require the tool guide aiming device of Group III.

The inventions listed as Groups II and IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The tool guide of Group II requires electronic encoding which is not required by the tool guide of Group IV.

The inventions listed as Groups III and IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The tool guide aiming device of Group III does not require the tool guide of Group IV.

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL04/00069

Continuation of B. **FIELDS SEARCHED** Item 3:

**BRS**

search terms: soft, hard, tissue, penetrate, bone, lock, guide, tool, drill, depth, sleeve, mark, register, measure, transparent.